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MANITOBA ECONOMIC

MULTIPLIERS

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PREFACE

This publication presents economic multipliers, intensity ratios and supply ratios for the Manitoba economy. All tables and results presented in this report have been derived from the Statistics Canada 1979 inter-provincial input-output model. The tables are at the medium level of aggregation (43 industries and 92 commodities) and include only data for Manitoba. The Manitoba Bureau of Statistics has available more detailed information, and subject to availability and confidentiality requirements, will provide it to interested users. In addition, the Bureau can arrange for specific simulations to be run using an in-house version of the model.

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I. EXECUTIVE SUMMARY

The multipliers presented in this publication show the direct, indirect and induced effects of a change in economic production on the Province of Manitoba. In addition, three different ways of measuring the impact of economic change are presented, namely the impact on Labour Income, Gross Domestic Product, and Employment.

Table One is in the form of intensity ratios and measures the total in-province impact per dollar of purchase for 92 different commodities. To use this table to estimate impacts for labour income or gross domestic product, the value of change in purchase is multiplied by the relevant commodity intensity ratio. To determine employment impacts, the value of change in purchase is divided by $10,000 and multiplied by the intensity ratio scaled in either 1979 or 1985 dollars.

Table Two is analogous to Table One, except that it is from the perspective of industry (43 groups) and the province of production rather than commodity and province of purchase.

Table Three consists of the traditional multipliers for 40 industries. To use these multipliers, for any given change in output, it must be possible to calculate the contribution to direct GDP and labour income and be given the number of direct jobs. The value of direct GDP, labour income and number of direct jobs is multiplied by the relevant industry multiplier to determine the impact.

Table Four identifies the source of commodities used in Manitoba.

A schematic summary for use of the first three tables is presented on the following page.

Users of multipliers should be cautioned, that because of certain methodological limitations, they are best used for comparative rather than absolute analysis.

SUMMARY OF USE OF MULTIPLIERS

INFORMATION REQUIRED

(1) Dollar value of a change in purchase of a commodity in Manitoba, → Use Table One → Locate commodity and multiply dollar value of change in purchase X relevant intensity ratio.

(2) Dollar Value of a change in output of an industry.

- Have just dollar value of change in output. → Use Table Two → Locate industry and multiply dollar value of change in output X relevant intensity ratio.
- Have sufficient detailed cost information to calculate direct GDP, Labour Income and Direct Employment. → Use Table Three → Locate industry and multiply calculated direct components X relevant multiplier.

II. INTRODUCTION

The estimate of Gross Domestic Product (GDP) found in the Manitoba Provincial Economic Accounts provides a measure of unduplicated economic production for the province. It is "unduplicated" because it measures only the value of final transactions - all inter-business purchases and sales associated with intermediate production are cancelled out. For example, if Industry A purchases a good from Industry B, to be used as an input in its production process, the transaction is not directly recorded in GDP. The value of the good purchased from Industry B is implicitly counted in the value of output of Industry A. If we were to count it at this intermediate stage of production (i.e., when it is used as an input into another industry) and count it again when the industry which purchased it sells it into final demand (i.e., when it is sold to households for consumption, to business for investment purposes, or is exported) we would be double counting its value.

A necessary by-product of the measurement of GDP is that the record of all these intermediate transactions is lost and extremely useful information concerning the linkages between industries is not revealed. Input-output accounts constitute an attempt to bring back into record these inter-industry flows of goods and services.

The most used components of the input-output accounts are the economic multipliers. The concept of a multiplier is a fairly simple one to understand. For example, when there is an increased demand for a commodity it has three effects. It impacts first on those firms which expand production to satisfy that demand. These are termed the "direct" effects. Secondly, there is a ripple effect as these firms must obtain more inputs which are provided by other industries. These are termed the "indirect" effects. Lastly, as all firms expand production they hire more staff and pay out more wages which increases the income received by households. The households spend most of this extra income which, in turn, increases the demand for other commodities starting the entire process again. These are termed the "induced" effects. When all three effects (direct, indirect and induced) are taken together they are referred to as the total effects.

Multipliers are calculated by taking the total change and dividing it by the direct change. Two main kinds of multipliers can be derived. The first are called "simple" multipliers and reflect only the direct and indirect effects. The second are called "total" multipliers and reflect not only the direct and indirect effects but the induced effects as well. Since most users are interested in the total effects only, these multipliers are included in the publication.

III. USES AND LIMITATIONS OF MULTIPLIERS

While economic multipliers can be a useful component in the decision making process, users should be aware of their limitations. Some of the most significant ones are that the provincial input-output model is static, not subject to the limits of production capacity, and is based on average patterns for technology and costs for commodities and industries. For these and other reasons the input-output model cannot provide a complete or absolute measure of the impact of economic change. For example, if there is an increase in demand for a commodity, the model assumes that (1) production can be met without a change in capacity (i.e., construction of new plants); (2) Manitoba industries will maintain their fixed share of the market, and the rest (if any) will be imported from the rest of Canada or outside the country, and (3) that the increase in input will be accomplished at the industry average costs of production using 1979 technology. It is unlikely that in the real world any of these assumptions would hold. In all probability, there would be a change in the market share and depending on the level of capacity, the marginal costs of an increase in output would be greater or lower than the average costs. In addition, there have been significant changes in technology in many industries since 1979.*

*Some of these problems can be corrected for by using an updated input structure based on current experience and subjecting it to a simulation using the MBS version of the input/output model. If users wish to exercise this option they should contact MBS directly (please note there will be a charge for this service).

In spite of these limitations, economic multipliers can be extremely useful especially when they are used for comparative rather than absolute purposes. The most common use for multipliers is in estimating the economic impact of the establishment of a new firm, or the expansion, contraction or closure of existing firms. As mentioned above, it is preferable to use multipliers to determine which of two or more activities has the greatest impact rather than using the multipliers to determine the absolute impact of a single event. If the multipliers are used to analyze a single event, the user should be cautioned that the results should be treated as general estimates only and not absolutes.

IV. DESCRIPTION OF TYPES OF MULTIPLIERS

Multipliers can be derived for either industries or commodities and expressed in absolute form or as intensity ratios. In addition, three different ways of measuring the impact of economic change are presented here, namely the impact on labour income, GDP (at factor cost) and employment. Below is a brief description of each of the four tables contained in this report and how they should be used.

TABLE 1

Table 1 is the total effects (direct, indirect and induced) of a dollar's purchase in Manitoba of each of the 92 commodities. The results are in the form of intensity ratios and measure the in-province effects in terms of labour income, GDP (at factor cost) and employment. Both labour income and GDP are expressed in terms of impact per dollar of purchase. For example, if demand

increased in Manitoba in 1985 for alcoholic beverages (Commodity 24) such that an additional $30,000 was purchased, the effects would be as follows: Total labour income would increase 0.247 x $30,000 = $7,410, while GDP would increase by 0.430 x $30,000 = $12,900. Employment has to be treated slightly differently. The first column for employment is scaled in units of $10,000 in 1979 dollars. If a price index for alcoholic beverages is available, it can be used to "inflate" the 1979 dollars to 1985 dollars by putting $\frac{\$10,000 \times 1985 \text{ (index 1979=100.0)}}{100}$ and dividing $30,000 (1985 dollars) by the result, then multiplying by 0.159. If a price index is not available, the column which expresses employment per $10,000 in 1985 dollars can be used (MBS has adjusted these ratios to reflect price changes from 1979 to 1985). In this case the result would be $\frac{\$30,000}{\$10,000} \times 0.083 = 0.249$ jobs.

TABLE 2

Table 2 is analogous to Table 1, except that it is from the perspective of industry (43 groups) and the province of production rather than commodity and province of purchase. For example, if there was an increase in output in the food and beverage industries (Industry 8) of $100,000, the effects would be as follows: labour income would increase 0.3755 x $100,000 = $37,550, while GDP would increase 0.7087 x $100,000 = $70,870. Employment, as in Table 1, has to be treated differently. If an industry selling price index for food and beverages is available, the process described under Table 1 would be repeated: $\frac{\$10,000 \times 1985 \text{ index (1979 = 100.0)}}{100}$ then dividing the result into $100,000 and multiplying by 0.2126. If a price index is not available, the ratio from the employment column scaled in units of $10,000 in 1985 dollars would be used. This would yield the result $\frac{\$100,000}{\$10,000} \times 0.1500 = 1.500$ jobs.

TABLE 3

Table 3 consists of the traditional multipliers (direct and indirect and induced effects over direct effects) for 40 industries. In order to use these multipliers, the direct GDP or labour content caused by a change in output must be calculated and the direct number of jobs created by the project must be given. The components which constitute direct GDP are items which make up a firm's operating surplus (wages, profits, interest, depreciation, etc.). It must be remembered that the change in output of a firm is not (in almost all cases) what constitutes its direct contribution to either labour income or GDP. This means that the multiplier is not simply applied to the change in output for an industry. To use the labour income multiplier, the amount of wages and supplementary labour income paid or lost as a result of a change in output must first be calculated, and then the multiplier applied to this value. In this case of GDP multiplier, the direct GDP content of a change in output is calculated and the multiplier is applied to this value. The employment multiplier is expressed in terms of total employment per direct job. For example, if a firm in the wood industries (Industry 15) was established, that employed 20 people directly, it would create a total of 20 x 1.883 = 37.66 jobs (i.e., 20 direct plus an additional 17.66 indirect and induced jobs).

TABLE 4

Table 4 shows the source of supply for commodities used in Manitoba. The data is presented in the form of ratios for: (1) Manitoba; (2) rest of Canada; and (3) rest of the World.

For example, 41.7 percent of other agricultural products (commodity 3) used in Manitoba were supplied from Manitoba sources, 46.7 percent came from the rest of Canada, and 11.6 percent came from outside Canada.

This table indicates the degree of "openess" of the Manitoba economy and the degree to which there is a dependence on imports.

V. EXAMPLES OF HOW TO USE THE MULTIPLIERS

Below is an example of how to use the multipliers and intensity ratios. Which one you choose and how you use them depends on what information you have at your disposal.

EXAMPLE

The task is to analyze which of two projects will have the larger economic benefit to the province. The following information is given:

(1) Project One

Construction of a plant to produce machinery. It will cost $5.0 million to build in 1985, and a further $3.0 million will be spent purchasing machinery and equipment. When in operation in 1986, it will employ 11 people and generate sales of $1,000,000 with the following distribution of costs.

$ 205,900	Wages
22,100	Interest
37,900	Profit
13,000	Depreciation
30,000	Overhead
691,100	Materials
$1,000,000	TOTAL

(2) Project Two

Expansion of output of an establishment in the metal mines classification of $1 million in 1985 and 1986.

ANALYSIS OF PROJECT ONE

To analyze the impact of Project One, it would be divided into two phases. The first phase would be that of construction of the plant and the purchase of the machinery and equipment, both of which would occur in 1985. The second phase would be the effect of the yearly output of the plant commencing in 1986.

CONSTRUCTION PHASE OF PROJECT ONE

To measure the impact of the construction phase, refer to Table 1 and look under Commodity 71, Non-Residential Construction. The commodity table is used because the construction would be done in Manitoba by contractors whose output or commodity is "construction" (in this case non-residential). In addition, there is a purchase of $3.09 million for machinery and equipment. If the kind of machinery is specified, it may be possible to match it directly with a listed commodity. If this is not possible, then the machinery and equipment listed at the end of the table (listed as Commodity 100) would be used.

The construction phase would have the following effects: labour income would grow by 0.543 x $5,000,000 = $2,715,000. GDP would increase 0.766 x $5,000,000 = $3,830,000. Employment would increase (using the column scaled in 1985 dollars) $\frac{\$5,000,000}{\$10,000}$ x 0.212 = 106 persons.

The impact of the purchase of machinery and equipment would be as follows: labour income would increase 0.083 x $3,000,000 = $249,000. GDP would increase 0.123 x $3,000,000 = $369,000. Employment would increase by $\frac{\$3,000,000}{\$10,000}$ x 0.040 = 12 persons.

It is obvious by their relative values, that Manitoba derives more benefit from construction activity than from purchases of machinery and equipment. This is because of the higher proportion of Manitoba content in construction (i.e., labour, more local materials) than in machinery and equipment which is generally produced outside the province.

OPERATIONS PHASE

The second impact of Project One is the actual operation of the plant which would take place in 1986. Since it is an industry that is being dealt with, the industry tables (Tables 2 and 3) would be used. As well, both the value of output and a breakdown of costs has been given, therefore either the industry intensity ratios (Table 2) or the industry multipliers (Table 3) can be used. To use Table 2, locate the industry (use the 1970 SIC manual if it is uncertain) and apply the ratios to the value of output. In this case, it is industry number 21, machinery industries.

Labour Income	0.3653 x $1,000,000 = $365,300
GDP	0.5646 x $1,000,000 = $564,600
Employment* (1985 ratio)	0.1788 x $\frac{\$1,000,000}{\$10,000}$ = 17.88

*If you know the inflation rate for this industry in 1986, you can reduce the 1985 ratio by the appropriate amount. If not, use the 1985 ratio but recognize that it will marginally overstate the employment impacts.

Since detailed cost information has also be given, the industry multipliers given in Table 3 can be used. The first step is to analyze the cost categories and identify which ones do and do not enter into a firm's operating surplus, and hence directly into GDP. Wages, profit, interest, and depreciation are primary inputs (i.e., they are not purchased from another industry) and go directly into GDP. In this case it leaves two categories, overhead and materials, to be determined. If overhead consists of rent payments and salaries for administration which is the assumption in this case, it would also enter directly into GDP. Materials and other purchased inputs do not enter directly into GDP as they are purchased from other industries and will be reflected in the indirect effects. Therefore the following is the case.

$ 205,919	Wages	Direct GDP
22,100	Interest	Direct GDP
37,900	Profit	Direct GDP
13,000	Depreciation	Direct GDP
29,943	Overhead (rent)	Direct GDP
$ 308,862	Sub-Total Direct GDP	Direct GDP
691,138	Materials	Indirect GDP
$1,000,000	Total Costs	Gross Output

There is a total of $308,862 out of the $1,000,000 gross output that constitutes the firms direct contribution to GDP. There is also $205,919 of direct labour income and 11 direct jobs. To these values, the relevant multipliers for Industry 21 would be applied.

Labour Income	1.774 x $205,918 = $365,300
GDP	1.828 x $308,862 = $564,600
Employment	1.649 x 11 = 18.139

These results are identical to what was calculated using the intensity ratios. In actual practice the multipliers (Table 3) should be used, if possible, because the intensity ratios (Table 2) assume an "average" direct contribution to GDP for a given change in output for each industry. In practice, an industry could vary substantially from the average (for example, it could have a higher or lower labour content) and more accuracy can be obtained by calculating the firm's direct contribution to GDP than by relying on the averages implied in the intensity ratios.

ANALYSIS OF PROJECT TWO

In analyzing Project Two, the only information given is that it is an increase in output of $1 million in 1985 and 1986 for an establishment classified to the metal mines industry group. Since only industry data has been given, one of the industry tables (2 and 3) must be used. Since it is not possible to calculate the direct GDP content of the change in output (there is no breakdown of costs given) the industry intensity ratios on table number 2 must be used. On Table 2, metal mines is listed as industry number 4. The change in the value of output would be applied to each ratio.

Labour Income	0.4637 x $1,000,000	= $463,700
GDP	1.0145 x $1,000,000	= $1,014,500
Employment	0.2571 x $1,000,000 / $10,000	= 25.71

Since the change in output of $1,000,000 is the same for both 1985 and 1986, the results would be the same for both years.

It is possible to allow for price increases in calculating employment beyond the year 1985. For example, if it is known that the industry selling prices for metal mines will increase in 1986 by five percent, the equation for determining employment (scaled in 1985 dollars) could be adjusted as follows.

$$\text{Employment 1986} \quad 0.2571 \times \frac{\$1,000,000}{(\$10,000 \times 1.05^{*})}$$

*to reflect 5% increase in selling price

$$\text{Employment 1986} \quad 0.2571 \times \frac{\$1,000,000}{\$10,500} = 24.49$$

The last step is to compare the results of the two projects. A summary of the results is as follows.

	1985	1986
Labour Income		
Project One	$2,964,000	$ 365,300
Project Two	$ 463,700	$ 463,700
GDP (at factor cost)		
Project One	$4,199,000	$ 564,600
Project Two	$1,014,500	$1,014,500
Employment		
Project One	118.0	17.88
Project Two	25.7	24.5

It can been seen quite clearly that Project One has the largest effect in 1985. The impact though, is entirely due to the construction of the plant. If a longer term outlook is taken, then Project Two will have the larger benefits. This is shown by comparing the benefits in 1986 where Project Two has greater impact than Project One in all three areas.

TABLE 1: MANITOBA COMMODITY INTENSITY RATIOS

COMMODITY	TOTAL LABOUR INCOME PER DOLLAR PURCHASED	TOTAL GDP (FACTOR COST) PER DOLLAR PURCHASED	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1985 DOLLARS
1 GRAINS	0.217	0.406	0.174	0.152
2 LIVE ANIMALS	0.368	0.689	0.288	0.282
3 OTHER AGRICULTURAL PRODUCTS	0.191	0.357	0.154	0.120
4 FORESTRY PRODUCTS	0.556	0.823	0.547	0.496
5 FISH LANDINGS	0.034	0.059	0.015	0.011
6 HUNTING & TRAPPING PRODUCTS	0.000	0.000	0.000	0.000
7 IRON ORES & CONCENTRATES	0.000	0.000	0.000	0.000
8 OTHER METAL ORES & CONCENTRATES	0.345	0.754	0.182	0.192
9 COAL	0.008	0.014	0.005	0.004
10 CRUDE MINERAL OILS	0.009	0.025	0.005	0.002
11 NATURAL GAS	0.004	0.007	0.003	0.001
12 NON-METALLIC MINERALS	0.221	0.416	0.126	0.078
13 SERVICES INCIDENTAL TO MINING	0.537	0.933	0.356	0.207
14 MEAT PRODUCTS	0.293	0.492	0.153	0.132
15 DAIRY PRODUCTS	0.362	0.600	0.199	0.120
16 FISH PRODUCTS	0.009	0.015	0.006	0.005
17 FRUITS & VEGETABLES PREPARATIONS	0.059	0.131	0.040	0.025
18 FEEDS	0.181	0.388	0.101	0.079
19 FLOUR,WHEAT,MEAL, & OTHER CEREAL	0.211	0.296	0.114	0.077
20 BREAKFAST CEREAL & OTHER BAKERY PROD	0.342	0.488	0.208	0.116
21 SUGAR	0.185	0.296	0.100	0.089
22 MISC. FOOD PRODUCTS	0.072	0.230	0.053	0.039
23 SOFT DRINKS	0.344	0.502	0.232	0.142
24 ALCOHOLIC BEVERAGES	0.247	0.430	0.159	0.083
25 TOBACCO PROCESSED UNMANUFACTURED	0.000	0.000	0.000	0.000
26 CIGARETTES & TOBACCO MFG.	0.011	0.018	0.006	0.003
27 TIRES & TUBES	0.006	0.010	0.003	0.002
28 OTHER RUBBER PRODUCTS	0.012	0.019	0.007	0.004
29 PLASTIC FABRICATED PRODUCTS	0.066	0.105	0.042	0.030
30 LEATHER & LEATHER PRODUCTS	0.042	0.065	0.033	0.026
31 YARNS & MAN MADE FIBRES	0.010	0.021	0.008	0.006
32 FABRICS	0.020	0.029	0.015	0.013
33 OTHER TEXTILE PRODUCTS	0.068	0.097	0.052	0.037
34 HOSIERY & KNITTED WEAR	0.020	0.031	0.015	0.011
35 CLOTHING & ACCESSORIES	0.090	0.135	0.077	0.054
36 LUMBER & TIMBER	0.107	0.178	0.090	0.088
37 VENEER & PLYWOOD	0.012	0.019	0.007	0.007
38 OTHER WOOD FABRICATED MATERIAL	0.220	0.343	0.174	0.123
39 FURNITURE & FIXTURES	0.181	0.274	0.132	0.081
40 PULP	0.011	0.019	0.007	0.006
41 NEWSPRINT & OTHER PAPER STOCK	0.099	0.181	0.067	0.041
42 PAPER PRODUCTS	0.127	0.203	0.079	0.065
43 PRINTING & PUBLISHING	0.402	0.518	0.252	0.160
44 ADVERTISING,PRINT MEDIA	0.725	0.935	0.459	0.291
45 IRON & STEEL PRODUCTS	0.081	0.145	0.051	0.036
46 ALUMINUM PRODUCTS	0.068	0.120	0.049	0.036

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 1 (CONT'D): MANITOBA COMMODITY INTENSITY RATIOS

COMMODITY	TOTAL LABOUR INCOME PER DOLLAR PURCHASED	TOTAL GDP (FACTOR COST) PER DOLLAR PURCHASED	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PURCHASED IN 1985 DOLLARS
47 COPPER & COPPER ALLOY PRODUCTS	0.047	0.087	0.028	0.029
48 NICKEL PRODUCTS	0.111	0.240	0.057	0.054
49 OTHER NON FERROUS METAL PROD	0.126	0.262	0.091	0.110
50 BOILERS, TANKS, & PLATES	0.125	0.202	0.093	0.072
51 FABRICATED STRUCTURAL METAL PROD	0.277	0.431	0.165	0.114
52 OTHER METAL FABRICATED PRODUCTS	0.101	0.154	0.065	0.045
53 AGRICULTURAL MACHINERY	0.015	0.024	0.011	0.007
54 OTHER INDUSTRIAL MACHINERY	0.046	0.066	0.031	0.020
55 MOTOR VEHICLES	0.011	0.016	0.008	0.005
56 MOTOR VEHICLE PARTS	0.048	0.068	0.031	0.021
57 OTHER TRANSPORT EQUIPMENT	0.090	0.136	0.054	0.041
58 APPLIANCES & RECEIVERS, HOUSEHOLD	0.009	0.013	0.005	0.004
59 OTHER ELECTRICAL PRODUCTS	0.048	0.077	0.033	0.021
60 CEMENT & CONCRETE PRODUCTS	0.382	0.770	0.230	0.157
61 OTHER NON-METALLIC MINERAL PROD	0.052	0.082	0.036	0.022
62 GASOLINE & FUEL OIL	0.042	0.018	0.025	0.010
63 OTHER PETROLEUM & COAL PRODUCTS	0.051	0.070	0.032	0.014
64 INDUSTRIAL CHEMICALS	0.044	0.085	0.028	0.018
65 FERTILIZERS	0.030	0.059	0.020	0.016
66 PHARMACEUTICALS	0.041	0.048	0.019	0.011
67 OTHER CHEMICAL PRODUCTS	0.045	0.082	0.028	0.018
68 SCIENTIFIC EQUIPMENT	0.074	0.092	0.052	0.033
69 OTHER MANUFACTURED PRODUCTS	0.068	0.090	0.047	0.030
70 RESIDENTIAL CONSTRUCTION	0.540	0.742	0.341	0.272
71 NON-RESIDENTIAL CONSTRUCTION	0.543	0.766	0.347	0.242
72 REPAIR CONSTRUCTION	0.544	0.715	0.429	0.342
73 PIPELINE TRANSPORTATION	0.052	0.493	0.051	0.023
74 TRANSPORTATION & STORAGE	0.301	0.403	0.154	0.070
75 RADIO & TELEVISION BROADCASTING	0.625	0.721	0.352	0.265
76 TELEPHONE & TELEGRAPH	0.513	1.072	0.400	0.311
77 POSTAL SERVICES	1.486	1.515	0.921	0.448
78 ELECTRIC POWER	0.292	1.142	0.228	0.162
79 OTHER UTILITIES	0.332	0.946	0.212	0.129
80 WHOLESALE MARGINS	0.357	0.531	0.227	0.152
81 RETAIL MARGINS	0.776	1.116	0.819	0.551
82 IMPUTED RENT OWNER OCPD. DWEL.	0.127	0.715	0.065	0.044
83 OTHER FINANCE,INS.,REAL ESTATE	0.204	0.374	0.138	0.079
84 BUSINESS SERVICES	0.251	0.365	0.182	0.104
85 EDUCATION SERVICES	1.340	1.257	0.695	0.436
86 HEALTH SERVICES	1.053	1.302	0.369	0.235
87 AMUSEMENT & RECREATION SERVICES	0.559	0.979	0.622	0.401
88 ACCOMODATION & FOOD SERVICES	0.670	0.982	0.613	0.403
89 OTHER PERSONAL & MISC. SERVICES	0.710	1.045	0.564	0.384
90 TRANSPORTATION MARGINS	0.084	0.124	0.047	0.021
91 OPERATING, OFFICE, LAB. & FOOD	0.327	0.470	0.243	0.159
92 TRAVEL, ADVERTISING & PROMOTION	0.470	0.647	0.330	0.182
100 MACHINERY & EQUIPMENT	0.083	0.123	0.058	0.040

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 2: MANITOBA INDUSTRY INTENSITY RATIOS

INDUSTRY	TOTAL LABOUR INCOME PER DOLLAR OF PRODUCTION	TOTAL GDP (FACTOR COST) PER DOLLAR OF PRODUCTION	TOTAL EMPLOYMENT PER $10,000 PRODUCTION IN 1979 DOLLARS	TOTAL EMPLOYMENT PER $10,000 PRODUCTION IN 1985 DOLLARS
1 AGRICULTURE	0.4383	0.8223	0.3410	0.3059
2 FORESTRY	0.6050	0.8849	0.6086	0.5515
3 FISHING, HUNTING, & TRAPPING	0.6123	1.0875	0.2156	0.1609
4 METAL MINES	0.4637	1.0145	0.2436	0.2571
5 MINERAL FUELS	0.1546	0.7209	0.0915	0.0393
6 NON-METAL MINES & QUARRIES	0.4289	0.9549	0.2634	0.1623
7 SERVICES INCIDENTAL TO MINING	0.5572	0.9176	0.4019	0.2341
8 FOOD & BEVERAGE INDUSTRIES	0.3755	0.7087	0.2126	0.1500
9 TOBACCO PRODUCTS INDUSTRIES	0.0000	0.0000	0.0000	0.0000
10 RUBBER & PLASTICS PRODUCTS IND	0.3750	0.6031	0.2443	0.1657
11 LEATHER INDUSTRIES	0.3577	0.5661	0.2917	0.2319
12 TEXTILE INDUSTRIES	0.3952	0.6388	0.3153	0.2246
13 KNITTING MILLS	0.3989	0.6125	0.2737	0.2057
14 CLOTHING INDUSTRIES	0.4726	0.7090	0.4177	0.2939
15 WOOD INDUSTRIES	0.5253	0.8208	0.4262	0.4169
16 FURNITURE, & FIXTURE INDUSTRIES	0.5367	0.8082	0.3963	0.2565
17 PAPER & ALLIED INDUSTRIES	0.3836	0.6910	0.2529	0.1746
18 PRINTING & PUBLISHING	0.7363	0.9481	0.4639	0.3129
19 PRIMARY METAL INDUSTRIES	0.3842	0.8059	0.2199	0.1790
20 METAL FABRICATING INDUSTRIES	0.4749	0.7268	0.2908	0.2010
21 MACHINERY INDUSTRIES	0.3653	0.5646	0.2687	0.1708
22 TRANSPORTATION EQUIPMENT IND	0.5388	0.7711	0.3978	0.2663
23 ELECTRICAL PRODUCTS INDUSTRIES	0.3913	0.6240	0.2679	0.1935
24 NON-METALLIC MINERAL PROD. IND	0.4184	0.8477	0.2706	0.1667
25 PETROLEUM & COAL PRODUCTS IND	0.0036	0.0321	0.0485	0.0208
26 CHEMICAL & CHEMICAL PROD. IND	0.3189	0.5480	0.1953	0.1253
27 MISC. MANUFACTURING INDUSTRIES	0.7543	0.9216	0.5568	0.3589
28 CONSTRUCTION INDUSTRY	0.5400	0.7495	0.3618	0.2510
29 TRANSPORTATION & STORAGE	0.6177	0.9499	0.3374	0.1529
30 COMMUNICATION	0.8086	1.2273	0.5436	0.4099
31 ELEC. POWER,GAS,OTHER UTILITIES	0.2940	1.1167	0.2243	0.1399
32 WHOLESALE TRADE	0.7555	1.1012	0.4774	0.3203
33 RETAIL TRADE	0.7793	1.1176	0.8190	0.5510
34 OWNER OCCUPIED DWELLINGS	0.1273	0.7152	0.0646	0.0437
35 OTHER FINANCE,INS., & REAL ESTATE	0.4916	0.9016	0.3331	0.1906
36 EDUCATION & HEALTH SERVICES	1.0733	1.2989	0.3925	0.2486
37 AMUSEMENT & RECREATION SERVICES	0.5474	0.9723	0.6206	0.4001
38 SERVICES TO BUSINESS MANAGEMENT	0.7387	1.0828	0.5757	0.3295
39 ACCOMODATION & FOOD SERVICES	0.6779	0.9791	0.6150	0.4047
40 OTHER PERSONAL & MISC. SERVICES	0.8206	1.0952	0.6144	0.4180
41 TRANSPORTATION MARGINS	0.1887	0.2783	0.1017	0.0461
42 OPERATING,OFFICE,LAB. & FOOD	0.3266	0.4701	0.2425	0.1583
43 TRAVEL & ADVERTISING,PROMOTION	0.4780	0.6469	0.3297	0.1823

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 3: MANITOBA INDUSTRY MULTIPLIERS

INDUSTRY	TOTAL LABOUR INCOME PER DOLLAR OF DIRECT LABOUR INCOME	TOTAL GDP (FACTOR COST) PER DOLLAR OF DIRECT GDP	TOTAL EMPLOYMENT PER DIRECT JOB
1 AGRICULTURE	1.711	1.620	1.396
2 FORESTRY	1.701	2.006	1.424
3 FISHING, HUNTING, & TRAPPING	1.450	1.415	2.371
4 METAL MINES	1.588	1.399	1.896
5 MINERAL FUELS	3.031	1.557	6.004
6 NON-METAL MINES & QUARRIES	1.636	1.644	1.772
7 SERVICES INCIDENTAL TO MINING	1.644	1.633	1.583
8 FOOD & BEVERAGE INDUSTRIES	2.989	2.674	2.509
9 TOBACCO PRODUCTS INDUSTRIES	0.000	0.000	0.000
10 RUBBER & PLASTICS PRODUCTS IND	1.671	1.705	1.715
11 LEATHER INDUSTRIES	1.962	2.020	1.609
12 TEXTILE INDUSTRIES	1.559	1.550	1.432
13 KNITTING MILLS	1.516	1.595	1.529
14 CLOTHING INDUSTRIES	1.552	1.611	1.382
15 WOOD INDUSTRIES	1.942	1.907	1.883
16 FURNITURE, & FIXTURE INDUSTRIES	1.592	1.683	1.521
17 PAPER & ALLIED INDUSTRIES	2.019	1.910	2.432
18 PRINTING & PUBLISHING	1.712	2.041	1.767
19 PRIMARY METAL INDUSTRIES	2.997	2.839	3.120
20 METAL FABRICATING INDUSTRIES	1.656	1.737	1.740
21 MACHINERY INDUSTRIES	1.774	1.820	1.649
22 TRANSPORTATION EQUIPMENT IND	1.575	1.725	1.491
23 ELECTRICAL PRODUCTS INDUSTRIES	1.658	1.722	1.657
24 NON-METALLIC MINERAL PROD. IND	1.843	1.754	1.916
25 PETROLEUM & COAL PRODUCTS IND	2.530	-0.424	3.451
26 CHEMICAL & CHEMICAL PROD. IND	2.087	2.139	2.317
27 MISC. MANUFACTURING INDUSTRIES	1.701	2.106	1.582
28 CONSTRUCTION INDUSTRY	1.713	1.940	1.779
29 TRANSPORTATION & STORAGE	1.660	1.733	1.939
30 COMMUNICATION	1.559	1.608	1.602
31 ELEC. POWER,GAS,OTHER UTILITIES	1.620	1.183	1.494
32 WHOLESALE TRADE	1.553	1.658	1.607
33 RETAIL TRADE	1.571	1.721	1.351
34 OWNER OCCUPIED DWELLINGS	4.748	1.234	
35 OTHER FINANCE,INS., & REAL ESTATE	1.702	1.616	1.790
36 EDUCATION & HEALTH SERVICES	1.453	1.727	2.340
37 AMUSEMENT & RECREATION SERVICES	1.974	1.803	1.513
38 SERVICES TO BUSINESS MANAGEMENT	1.566	1.665	1.350
39 ACCOMODATION & FOOD SERVICES	1.646	1.823	1.389
40 OTHER PERSONAL & MISC. SERVICES	1.465	1.644	1.131

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

TABLE 4: MANITOBA COMMODITY SUPPLY RATIOS *

COMMODITY	MANITOBA	REST OF CANADA	REST OF WORLD
1 GRAINS	0.477	0.375	0.148
2 LIVE ANIMALS	0.829	0.166	0.005
3 OTHER AGRICULTURAL PRODUCTS	0.417	0.467	0.117
4 FORESTRY PRODUCTS	0.926	0.074	0.000
5 FISH LANDINGS	0.037	0.963	0.000
6 HUNTING & TRAPPING PRODUCTS	0.000	0.001	0.999
7 IRON ORES & CONCENTRATES	0.000	0.000	1.000
8 OTHER METAL ORES & CONCENTRATES	0.740	0.185	0.075
9 COAL	0.000	0.915	0.085
10 CRUDE MINERAL OILS	0.022	0.978	0.000
11 NATURAL GAS	0.000	1.000	0.000
12 NON-METALLIC MINERALS	0.415	0.517	0.068
13 SERVICES INCIDENTAL TO MINING	1.000	0.000	0.000
14 MEAT PRODUCTS	0.636	0.301	0.063
15 DAIRY PRODUCTS	0.681	0.309	0.010
16 FISH PRODUCTS	0.015	0.354	0.631
17 FRUITS & VEGETABLES PREPARATIONS	0.158	0.718	0.124
18 FEEDS	0.660	0.235	0.106
19 FLOUR,WHEAT,MEAL, & OTHER CEREAL	0.517	0.428	0.055
20 BREAKFAST CEREAL & OTHER BAKERY PROD	0.522	0.458	0.019
21 SUGAR	0.709	0.291	0.000
22 MISC. FOOD PRODUCTS	0.306	0.621	0.073
23 SOFT DRINKS	0.763	0.230	0.007
24 ALCOHOLIC BEVERAGES	0.509	0.313	0.179
25 TOBACCO PROCESSED UNMANUFACTURED	0.000	0.000	0.000
26 CIGARETTES & TOBACCO MFG.	0.000	0.994	0.006
27 TIRES & TUBES	0.000	0.592	0.408
28 OTHER RUBBER PRODUCTS	0.009	0.704	0.287
29 PLASTIC FABRICATED PRODUCTS	0.150	0.656	0.194
30 LEATHER & LEATHER PRODUCTS	0.078	0.650	0.272
31 YARNS & MAN MADE FIBRES	0.009	0.817	0.174
32 FABRICS	0.031	0.580	0.389
33 OTHER TEXTILE PRODUCTS	0.129	0.735	0.136
34 HOSIERY & KNITTED WEAR	0.030	0.644	0.326
35 CLOTHING & ACCESSORIES	0.173	0.696	0.131
36 LUMBER & TIMBER	0.167	0.646	0.187
37 VENEER & PLYWOOD	0.000	0.974	0.026
38 OTHER WOOD FABRICATED MATERIAL	0.404	0.493	0.103
39 FURNITURE & FIXTURES	0.331	0.566	0.103
40 PULP	0.001	0.797	0.202
41 NEWSPRINT & OTHER PAPER STOCK	0.226	0.680	0.094
42 PAPER PRODUCTS	0.335	0.593	0.072
43 PRINTING & PUBLISHING	0.530	0.317	0.153
44 ADVERTISING,PRINT MEDIA	1.000	0.000	0.000
45 IRON & STEEL PRODUCTS	0.168	0.733	0.100
46 ALUMINUM PRODUCTS	0.198	0.701	0.101

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

* ratio of total commodities used in Manitoba by source of supply

TABLE 4 (CONT'D): MANITOBA COMMODITY SUPPLY RATIOS ◊

COMMODITY	MANITOBA	REST OF CANADA	REST OF WORLD
47 COPPER & COPPER ALLOY PRODUCTS	0.064	0.885	0.051
48 NICKEL PRODUCTS	0.276	0.080	0.643
49 OTHER NON FERROUS METAL PROD	0.379	0.254	0.367
50 BOILERS, TANKS, & PLATES	0.316	0.559	0.125
51 FABRICATED STRUCTURAL METAL PROD	0.535	0.416	0.048
52 OTHER METAL FABRICATED PRODUCTS	0.208	0.549	0.244
53 AGRICULTURAL MACHINERY	0.042	0.053	0.905
54 OTHER INDUSTRIAL MACHINERY	0.086	0.317	0.597
55 MOTOR VEHICLES	0.018	0.337	0.646
56 MOTOR VEHICLE PARTS	0.083	0.214	0.703
57 OTHER TRANSPORT EQUIPMENT	0.145	0.308	0.547
58 APPLIANCES & RECEIVERS, HOUSEHOLD	0.004	0.594	0.402
59 OTHER ELECTRICAL PRODUCTS	0.091	0.645	0.264
60 CEMENT & CONCRETE PRODUCTS	0.908	0.090	0.002
61 OTHER NON-METALLIC MINERAL PROD	0.072	0.640	0.287
62 GASOLINE & FUEL OIL	0.488	0.364	0.148
63 OTHER PETROLEUM & COAL PRODUCTS	0.368	0.459	0.172
64 INDUSTRIAL CHEMICALS	0.116	0.596	0.288
65 FERTILIZERS	0.094	0.084	0.822
66 PHARMACEUTICALS	0.065	0.897	0.037
67 OTHER CHEMICAL PRODUCTS	0.119	0.650	0.231
68 SCIENTIFIC EQUIPMENT	0.088	0.399	0.513
69 OTHER MANUFACTURED PRODUCTS	0.091	0.554	0.355
70 RESIDENTIAL CONSTRUCTION	1.000	0.000	0.000
71 NON-RESIDENTIAL CONSTRUCTION	1.000	0.000	0.000
72 REPAIR CONSTRUCTION	1.000	0.000	0.000
73 PIPELINE TRANSPORTATION	0.613	0.331	0.056
74 TRANSPORTATION & STORAGE	0.384	0.604	0.012
75 RADIO & TELEVISION BROADCASTING	0.450	0.541	0.009
76 TELEPHONE & TELEGRAPH	0.995	0.000	0.005
77 POSTAL SERVICES	0.999	0.000	0.001
78 ELECTRIC POWER	1.000	0.000	0.000
79 OTHER UTILITIES	1.000	0.000	0.000
80 WHOLESALE MARGINS	0.496	0.494	0.010
81 RETAIL MARGINS	1.000	0.000	0.000
82 IMPUTED RENT OWNER OCPD. DWEL.	1.000	0.000	0.000
83 OTHER FINANCE,INS.,REAL ESTATE	0.402	0.578	0.021
84 BUSINESS SERVICES	0.324	0.519	0.158
85 EDUCATION SERVICES	1.000	0.000	0.000
86 HEALTH SERVICES	1.000	0.000	0.000
87 AMUSEMENT & RECREATION SERVICES	0.998	0.000	0.002
88 ACCOMODATION & FOOD SERVICES	1.000	0.000	0.000
89 OTHER PERSONAL & MISC. SERVICES	0.977	0.020	0.002
90 TRANSPORTATION MARGINS	0.178	0.822	0.000
91 OPERATING, OFFICE, LAB. & FOOD	1.000	0.000	0.000
92 TRAVEL, ADVERTISING & PROMOTION	1.000	0.000	0.000

SOURCE: MANITOBA BUREAU OF STATISTICS
STATISTICS CANADA 1979 INTERPROVINCIAL INPUT-OUTPUT MODEL

◊ ratio of total commodities used in Manitoba by source of supply